

June
2021

समाचार पत्रों से चयित अंश Newspapers Clippings

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खंड : 46 अंक : 109 04 जून 2021

Vol.: 46 Issue : 109 04 June 2021



रक्षा विज्ञान पुस्तकालय
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Fri, 04 June 2021

India is prepared for Biological Warfare: Defence Secretary

By Ravi Shankar

The danger of Biological Warfare is receiving huge attention amidst the ongoing COVID-19 pandemic and the strengthening perception of Coronavirus being a Chinese bioweapon created in a laboratory in Wuhan. In fact, the conspiracy theory is gaining ground, globally. Reacting to how India is addressing the concerns, Defence Secretary Dr Ajay Kumar declared, “Of course, we are prepared for Biological Warfare. Some of the things which came out recently to combat, COVID from defence DRDO labs, were a part of preparations for such an eventuality.”

Speaking on cyber threats, Dr Kumar said, “Cyber threats are extremely real and India is facing cyber-attacks on civilian and military infrastructure all the time. This is one area where the government is redefining the security threat perception of the country because putting down the power infrastructure of a city or the financial cyber infrastructure; you can do as much damage as is possible by a bombing. So, we are redefining it”.



Image Courtesy: Defence XP

Providing details of the initiatives taken in this regard, the Defence Secretary said the government has initiated several steps to secure its cyberspace. “Within defence, We have recently recognised this and created a defence cyber agency. We have separate cyber infrastructure for armed forces. National Cyber Coordination Centre coordinates the overall cyber security architecture of the country between various agencies”.

He also highlighted the technological limitations in this field which compromises the cyber security infrastructure of the country. “The fundamental cyber security starts from video communication infrastructure and it is true that the communication infrastructure that we use is largely brought from outside. As long as we continue to do this we will remain dependent on someone, therefore the cyber security could be compromised”, Dr Kumar rued.

On the issue of 5G technology, the senior bureaucrat exhorted the Indian industry to achieve a significant amount of capability development to thwart the advantages that the Chinese have with their technological advancements in this arena.

“If we look at 5G, we now that 2G to 4G was dominated largely by the Western world – Europe and America but 5G is dominated by China. When we look at the 5G equipment there is this big dilemma of what to do? This has multiple dimensions because 50 to 60 per cent of the equipment is

coming from Huawei and other Chinese companies. Therefore, there is a need for us to develop our own technology in the communication sector. I'm happy to share that today some work has been going on and some has already been done. Several components of 5G infrastructure are now being designed and developed in India but we are still far off," the Defence Secretary said.

Addressing a webinar on "Recent Reforms in India's National Security Apparatus" organised by Special Centre for National Security Studies (SCNSS), JNU on 2 June, he said, it is very exciting times in the Ministry of Defence which is witnessing a huge change in the national security apparatus not seen in the last two decades. Expressing satisfaction over the pace of military reforms he said, "For the first time, all recommendations related to defence reforms put forward by several committees following the Kargil War have started taking shape, not seen in the past, which has a tremendous impact on our defence preparedness."

He touched upon the various defence reforms which have been undertaken keeping in view the present security challenges and geopolitical scenario and appreciated the political will to carry out such changes which were long overdue. The formation of the Chief of Defence Staff (CDS) and the Department of Military Affairs (DMA) for greater integration of armed forces go a long way in this endeavour.

"Today when we look at our problems on the northern borders, the response to coordination at the level of CDS enables us to enhance our ability to respond to any situation whether in the northern border or on coastal borders," said Dr Kumar.

Speaking on the issue of the defence industry and the goal of self-reliance, he listed several initiatives which have been realised in recent times. He emphasised that the Indian defence sector has transformed from a licensed industry to an almost de-licensed regime. The extent of private participation is at an all-time. As an incentive the government had decided that 101 items will not be imported and can only be bought from Indian manufacturers. Now, 108 items have been added to the list, last week. This list is going to progressively increase.

On the procurement issue, the Defence Secretary said that for the first time India has earmarked a separate budget for procuring from the domestic market. In a very significant decision, the government has decided that 25 per cent of total domestic procurement will be from the private industry. The percentage can be more as well. Giving details of industry dynamics related to procurement he informed that more than 50 per cent of procurement done by public sector undertakings are from the private industry. "If you add both of these then we are looking at nearly 45-50 to 65 per cent of our defence products coming from the private defence sector," he said optimistically.

Giving impetus to the defence start-ups in the country he informed that the government has allocated Rs. 1000 crore and hoped India will have a defence start-ups unicorn very soon.

On the export front, the senior official said India had exported defence products worth Rs. 105 crore two years ago. It's Rs. 11,000 crore now and 80 per cent of it came from the private sector because of policy changes. Informing about the export growth, he said for the first time India has been included in the SIPRI's exporters list. This has been a special journey coming from one of the largest importers to being in the exporters list.

<https://bharatshakti.in/india-is-prepared-for-biological-warfare-defence-secretary/>

The mirage of self-reliance

In the absence of robust technological and project management structures, MoD's indigenisation drive will remain questionable

By Ajai Shukla

New Delhi: Under Defence Minister Rajnath Singh, the Ministry of Defence (MoD) has upped its game impressively in the field of press announcements. There are regular bulletins on the defence minister's inauguration of assorted web portals and visits to his office by assorted Bharatiya Janata Party (BJP) office-holders. Amongst the subjects that often feature in MoD press releases is "Atmanirbhar Bharat" (Self-reliant India). Ironically, this phrase was first coined in Prime Minister (PM) Narendra Modi's broadcast to a locked down country on May 12, 2020, when India was grappling with the dual challenges of Chinese troop intrusions into Ladakh and the mass migration of millions fleeing the Covid-19 pandemic. Yet, like his cabinet contemporaries, Mr Singh understands he must generate credit for the PM by regularly invoking his signature schemes.



"Atmanirbhar Bharat" featured prominently in the MoD's announcement on Monday of the second "Positive Indigenisation List" of 108 items of defence equipment. Added to the first Positive Indigenisation List of 101 items that the MoD promulgated last August, there are now 209 defence items that must be compulsorily procured from Indian companies, the number rising each year out to 2025. At the start of this year, 69 items (mentioned in the first list last August) were embargoed for import. At the end of this year, another 60 items will come under the ban. Another 25 will be embargoed for import at the end of 2022; 25 more at the end of 2023; another 21 at the end of 2024 and nine on the New Year of 2026.

On the face of it, this is a laudable indigenisation initiative. "Our aim is to apprise the Indian defence industry about the anticipated requirements of the armed forces, so that they are better prepared to realise the goal of indigenization," declared Mr Singh at the release of the first list last August. He called it "a great opportunity" for the defence industry to deploy their own research, design and development capabilities, or take technology from the Defence Research & Development Organisation (DRDO) and manufacture products for the military. To be sure, a Positive Indigenisation List provides assurance to the domestic defence industry, which has frequently burned its fingers by expended money and research effort on developing a defence product, only to see the MoD import it from the global market instead.

However, there are legitimate questions over the usefulness of the lists released so far. Defence industry experts observe that defence firms already possess the capability to build at least two-third of the items specified. One chief executive agrees that the two lists together appear to be a summary of what is already under development in the country and nearing production.

To assess the efficacy of this incremental import ban, consider first the 69 items that were embargoed for import in the first list on January 1, 2021. This restricted the army to Indian suppliers for tracked, self-propelled and towed artillery guns, multi-barrelled rocket launchers of the Pinaka class, sniper rifles and bulletproof jackets and helmets. The navy is required to indigenously build several categories of warships, such as missile destroyers, next-generation missile vessels, anti-submarine craft, offshore patrol vessels and sonar systems and weaponry. The Indian Air Force (IAF) will have to build in India its requirement of light combat fighters (LCA) and helicopters, light transport aircraft, and parachute delivery systems for air-dropping stores and equipment.

In fact, this list presents little challenge to Indian manufacturers, who are well along in building these items. Larsen & Toubro has delivered 100 self-propelled artillery guns to the army and its production line near Pune lies idle, awaiting further orders. In towed artillery, the Ordnance Factory Board is confident about its indigenous 155-millimetre Dhanush howitzer, while the DRDO is putting its Advanced Towed Artillery Gun System (ATAGS) through user trials. The Pinaka rocket launcher is being manufactured in numbers already and more orders are awaited from the Indian Army. Similarly, the embargo on importing a range of warships only recognises an existing reality; out of 41 naval warships and submarines under construction, 39 are being built in Indian shipyards. Orders for 103 Tejas fighters have been placed with Hindustan Aeronautics Ltd (HAL), which is also anticipating large orders for its indigenous light attack and light utility helicopters and HTT-40 trainers.

The same is true for equipment that will face an import embargo from this year-end. Making the indigenisation bar easier to cross is the MoD policy that considers platforms built in India under transfer of technology (ToT), with 50 per cent indigenous content, as Atmanirbhar Bharat products. Scorpene submarines are already being built at Mazagon Dock Ltd (MDL) under ToT from Naval Group. The French shipbuilder is keen to build more Scorpenes, even as tendering proceeds for six more conventional submarines that will also be built in India. Nor is difficulty anticipated in building indigenous light helicopters (HAL); next-generation corvettes (Garden Reach Shipbuilders); armoured vehicles, anti-tank guided missiles and medium range surface to air missiles (DRDO), warship grade steel (Steel Authority of India) and other items listed.

Looking at the systems farthest into the future, self-reliance is mandated by December 2025 for long-range cruise missiles, anti-material rifles (AMR) and a 1,000 Horse Power tank engine. The DRDO (Nirbhay cruise missile) and the Kirloskar Group (tank engine) have these projects in hand.

For reasons unknown, an Indian company that wishes to design and develop a platform in-country, rather than by teaming with overseas OEMs, gets no preference in the “Atmanirbharta” scale. An example is L&T, which wanted to develop the “future infantry combat vehicle” ground-up in India but found that the MoD would give it no priority over the competing Indian firms, all of which were in partnering foreign OEMs that would control a major share of the intellectual property associated with the project.

If the MoD is serious about Atmanirbhar Bharat, it would frame its indigenisation targets with far greater thought and set up robust technological, project management and evaluation structures. Rather than focusing on low-hanging fruit and relying on foreign OEMs to meet production targets, each product targeted for indigenisation would cater for a realistic development time-frame, a highly qualified project manager who is guaranteed a realistic tenure and an adequate R&D budget. The unhealthy obsession with L-1 (lowest bid) tendering must be thrown overboard to avoid projects being derailed by companies that have a proven modus operandi of bidding unrealistically low and then failing to deliver. Instead, the MoD must institute an L-1, T-1 system, in which an unreasonably low price is not enough to gain an unfair win; along with price, a superior technology plan and project management plans are as important.

https://www.business-standard.com/article/opinion/the-mirage-of-self-reliance-121060301544_1.html

‘Positive indigenisation list’ got lengthier but India’s defence industry far from ready

Until the technological base of defence industry improves, ‘Make in India’ with transfer of technology and specified indigenous content may be a better bet

By Lt Gen H S Panag (Retd), Edited By Anurag Chaubey

On Monday, the Ministry of Defence announced the second negative import list — now renamed as the “positive indigenisation list” — of 108 items that can now be procured only from indigenous sources. This takes the total number on the negative list to 209. The first negative list of 101 items was announced on 9 August 2020. The implementation had begun with effect from December 2020 and will be progressively executed by December 2025. The aim behind promulgation of the list is to apprise the Indian defence industry about the anticipated requirements of the armed forces so that they are better prepared to realise the goal of indigenisation.



Defence Minister Rajnath Singh inaugurated the second production line for LCA Tejas in Bengaluru Tuesday | By special arrangement

The progressively expanding positive indigenisation list is certainly a big step towards self-sufficiency in defence. It is a great opportunity for the Indian defence industry to manufacture the items in the list by using their own design and development capabilities or adopting those developed by the Defence Research and Development Organisation (DRDO) to meet the requirements of the armed forces in the coming years.

India’s quest for self-sufficiency in defence began soon after Independence. The country has created a large defence industrial base comprising 39 ordnance factories, nine defence public sector undertakings, 150 diverse companies in the private sector and 50 dedicated research laboratories and establishments under the umbrella of the DRDO. India has designed and produced a fourth-plus generation fighter aircraft, nuclear submarine, main battle tank, state of the art cruise missile and intercontinental ballistic missile with a range of more than 5,000 km. Our defence exports in 2018-19 were worth Rs 10,745 crore. Ironically, we are also the second largest defence importers, accounting for 9.5 per cent of the world’s market share. That a day after the announcement of the second “negative list”, India floated a Request for Information for import/manufacture of 1,700 Future Ready Combat Vehicles, only confirms the irony.

The positive indigenisation list is an intrinsic part of the Defence Acquisition Procedure 2020. But the impact of the list on self-sufficiency is contingent on a host of factors.

Strategic review and defence reforms

The Ministry of Defence has been at pains to emphasise that all stakeholders, including Army, Air Force, Navy, DRDO, Defence Public Sector Undertakings, Ordnance Factory Board (OFB) and private industry have been consulted to assess current and future capabilities of the Indian industry for manufacturing various ammunition /weapons/platforms/equipment within India. However, the focus seems to be on the current needs of the armed forces, which are structured and organised to fight the wars of a bygone era.

India’s focus should be on conflict/wars that it is likely to fight in the next 30-40 years. The armed forces have to be transformed as also their weapon systems. This requires the armed forces to prepare a technological forecast for the industry. There is no point in producing a world class Advanced Towed Artillery Gun if it is going to fire a round developed 40 years ago.

Indian designed, developed and manufactured

For a product to be considered as an indigenous system, items on the positive indigenisation list must not only use technologies designed and developed by the Indian defence industry or the DRDO but also meet the specified requirement of sourcing indigenous content of 50 per cent.

Practically, it implies that from the date the embargo takes effect with respect to a particular item on the list, it can be procured only under “Buy (IDDM)” category — “Buy (Indian – Indigenous Designed, Developed and Manufactured)”. The rider of indigenous design and development has practically rendered all other procurement categories under Defence Acquisition Procedure 2020 (DAP 2020) irrelevant as they are designed and developed by Original Equipment Manufacturers. DAP 2020 (Paragraph 6 – Weapons/Platforms Banned for Import) has added to the ambiguity by implying that the same can also be done.

It is well known that most of the items in the list are already being manufactured in India. But as emerging technologies, which are not available in India, come to the fore, the rider of “indigenous design and development” will lead to less orders being placed under “Buy IDDM”. Until the research and development, and technological base of the defence industry and the DRDO improves, ‘Make in India’ with transfer of technology and specified indigenous content that can be progressively increased, may be a better bet.

Apprehensions of the industry

The defence industry requires a long-term forecast of the requirements, government investment in research, design and development and firm orders. The government has committed to spend 50 per cent of the capital budget, that is nearly Rs 70-75,000 crore, on indigenous procurement. There is a need for the MoD and the services to also give a forecast of its procurement plan in financial terms.

Defence industry requires a large initial investment. Domestic requirements cannot sustain it except for low-end technology items. Liberal incentives must be given for exports. Export target of \$5 billion is achievable if the government gives liberal incentives for export and actively promotes the same as is done by the leading arms exporting countries.

Armed forces involvement

The armed forces need to commit themselves to promote the indigenous defence industry. The Navy has shown the way and promoted indigenous design and development. The Army and the Air Force need to follow the example.

General Staff Qualitative Requirements must be realistically made, keeping the technological base of the defence industry. Since major equipment has a life span of 30-odd years, the requirements can be progressive with different Marks of the equipment for specified time periods.

Conclusion

The positive indigenisation list must not be seen in isolation as a panacea to create self-sufficiency in defence up to the desired 70-75 per cent level. It is both a protectionist measure as well as catalyst to invigorate our defence industry. The list is an integral part of DAP 2020 and there is a need for the “indigenous design and development” clause to be reviewed until the defence industry comes of age. China followed this path with Russian equipment from 1949-1990. Today it is almost self sufficient in defence and a major exporter.

There is no doubt that the Narendra Modi government has shown remarkable zeal to promote indigenisation in defence.

However, to fructify the vision, dynamic leadership is required. Think out of the box and appoint that leader.

(Lt Gen H S Panag PVSM, AVSM (R) served in the Indian Army for 40 years. He was GOC in C Northern Command and Central Command. Post retirement, he was Member of Armed Forces Tribunal. Views are personal.)

<https://theprint.in/opinion/positive-indigenisation-list-got-lengthier-but-indias-defence-industry-far-from-ready/670630/>

Defence stocks increases after Ministry of Defence puts 108 items on import ban list

Defence stocks such as Bharat Electronics Ltd, BEML, Hindustan Aeronautics Ltd, Garden Reach Shipbuilders, Astra Microwave Products, Bharat Dynamics, Mishra Dhatu Nigam, Mazagon Dock Shipbuilders and Bharat Forge are trading higher. An increase in defence stocks is seen because the Ministry of Defence (MOD) approved imposing restrictions on the import of 108 military weapons and systems such as next-generation corvettes, tank engines, airborne early warning systems and radars.

All the 108 military items will now be obtained from indigenous sources as per provisions given in a Defence Acquisition Procedure (DAP) 2020. The first negative list of defence imports containing 101 items was issued last year. “The Defence industry can productively utilise this golden opportunity to build robust Research and Development facilities, capabilities and capacities to meet the futuristic demands of the Armed Forces. This list also presents an excellent opportunity for ‘start-ups’ as well as to MSMEs which will get a tremendous boost from this initiative,” MOD said.

The ‘Second Positive Indigenisation List’ includes sensors, simulator, complex systems, weapons and ammunitions like Helicopters, Airborne Early Warning and Control (AEW&C) systems, Tank Engines, Next Generation Corvettes, MRSAM Weapon Systems, Medium Power Radar and many more such items to meet the demands of Indian Armed Forces. This second list is designed to be achieved progressively with effect from December 2021 to December 2025.

Increase in defence shares prices

After taking these decisions by the government of India, the prices of defence shares increased. On Tuesday, June 1, 2021, after the end of the day trading, Garden Reach Shipbuilders & Engineers and Hindustan Aeronautics Ltd share prices rose 5 per cent, each, to Rs 187.45 and Rs 1,045.95, respectively. Similarly, Astra Microwave Products surged 4.4 per cent, Bharat Dynamics gained 4.5 per cent, BEML was up 1.7 per cent, Mishra Dhatu Nigam (MIDHANI) gained 1.14 per cent, Bharat Forge gained 1.3 per cent and Mazagon Dock Shipbuilders shares were increased by 1.6 per cent. In comparison, the BSE Sensex was trading flat at 51,965.

Market Dynamics

India’s defence sector has been observing a CAGR of 3.9% between 2016 and 2020. The central government has set the defence production target of \$25.00 billion by 2025, including \$5 billion from exports by 2025. Defence exports in India were expected to be at \$1.29 billion in 2019-20. India’s defence import value stood at \$463 million for the financial year 2020 and is expected to be at US\$ 469.5 million in the financial year 2021. Defence exports in the country observed strong growth in the last two years. India targets to export military hardware worth \$5 billion in the next 5 years. As of 2019, India ranked 19th in the top defence exporters list in the world by exporting defence products to 42 countries.

Government Initiatives to boost defence sector

To increase more participation from start-ups and MSMEs in Defence Research & Development (R&D) in achieving the ‘AatmaNirbhar Bharat’ goal, Defence Minister Rajnath Singh released a new version of ‘Defence Research and Development Organisation (DRDO) Procurement Manual 2020’ on October 20, 2020.

- There are plans to build new infrastructure, including a defence park in Kerala to manufacture defence equipment for the armed forces. The project is intended at promoting MSMEs and boosting the ‘Make in India’ initiative.

- In November 2020, the Department of Defence, in partnership with the Directorate General Defence Estates (DGDE) and the Armed Forces, established a land management system (LMS) as part of efforts to enhance the overall defence land management.
- In February 2021, Defence Research and Development Organisation (DRDO) handed over Licensing Agreements for Transfer of Technology (LAToT) for 14 DRDO developed technologies to 20 industries at Aero India 2021 in Bengaluru.

To boost defence manufacturing in India and make the country a reliable weapon supplier to friendly countries, the Indian government allowed the following FDI limits in September 2020. For new licensees, FDI allowed up to 74 per cent through automatic route. FDI above 74 per cent would need to be permitted under the Government route. For existing licensees, Infusion of new foreign investments up to 49 per cent can be added by making declarations of change or transfer within 30 days.

Road Ahead for defence sector

The Indian government is concentrating on innovative solutions to empower the country's defence and security via 'Innovations for Defence Excellence (iDEX)', which has provided a platform for start-ups to connect to the defence establishments and develop new technologies and products in the next five years (2021-2026)

The Defence Ministry has set a target of 70 per cent independence in weaponry by 2027, creating tremendous prospects for industry players. Introduced Green Channel Status Policy (GCS) to encourage and promote private sector investments in defence production, to strengthen the role of the private sector in defence production.

<http://newsonair.com/2021/06/03/defence-stocks-increases-after-ministry-of-defence-puts-108-items-on-import-ban-list/>

BEML, with ToT from DRDO, starts making oxygen generating units

Company says more than 55% of employees vaccinated

Bengaluru: BEML Limited, a defence public sector company, has started manufacturing 960 LPM Medical Oxygen Plants at its KGF complex in record time under a transfer of technology (ToT) agreement with DRDO lab - Defence Bioengineering & ElectroMedical Laboratory (DEBEL), Bengaluru.

The first set of medical oxygen plants has been rolled out and is being delivered to Koppal Institute of Medical Sciences, in Karnataka.

In a regulatory filing to exchanges, BEML said it has received orders for 100 units from DEBEL on May 21, under 'PM Cares' fund and the same is expected to be supplied by end July, 2021.

In coordination with district level medical authorities, BEML is also establishing a 960 LPM capacity medical oxygen plant in one of the designated hospitals in Karnataka, under its CSR programme.

Initiatives to fight Covid

The company said it is making dedicated efforts to extend all possible assistance to the government bodies, medical units and front-line workers apart from taking care of employees and their families in combating the pandemic.

The company contributed ₹50 lakhs to DRDO towards opening of a 500-bed hospital for Covid patients. To provide immediate medical attention, the company has set up Covid Care Centers at its KGF and Bangalore Complexes. A fever clinic has also been established for examining the suspected Covid cases at the KGF Complex.

To boost the government's effort in vaccination, the company has conducted vaccination camps at BEML's KGF, Bangalore and Mysore complexes through medical staff in coordination with DHOs for the employees, their dependent family members, retired employees, contract workers and others.

"So far, a total of 3,174 employees, executives and contract workers have been vaccinated through this drive, which is more than 55 percent of the staff in the age group of 45 years and above. The vaccination for the employees below 45 years of age also has been started," company's release said.

<https://www.thehindubusinessline.com/companies/beml-with-tot-from-drdo-starts-making-oxygen-generating-units/article34717669.ece>



BEML manufacturing medical oxygen units

Bengaluru: In a bid to mitigate the oxygen shortage in the country, defence PSU major BEML has started manufacturing 960 LPM medical oxygen units at its KGF complex.

The units have been set up under a transfer of technology agreement with Defence Bio Engineering and Electro Medical Laboratory under the DRDO.

A release said that the first set of units has been rolled out and is being delivered to Koppal Institute of Medical Sciences. The BEML has received orders for 100 units in May 2021 under PM Cares fund and they will be supplied by the end of July.

The release said that in coordination with the district-level medical authorities, BEML is also establishing a 960 LPM capacity medical oxygen unit in one of the designated hospitals in Karnataka under CSR.



BEML staff who were involved in the commissioning of the oxygen units. | Photo Credit: Special Arrangement

<https://www.thehindu.com/news/national/karnataka/beml-manufacturing-medical-oxygen-plants/article34716700.ece>

J-K: Srinagar's 500 bed Covid-19 Hospital in final stages of completion

Srinagar (Jammu and Kashmir): A 500-bed Covid-19 hospital in Khonmoh area of Srinagar is in final stages of completion and will soon be open to the public.

The Jammu and Kashmir administration in a joint effort with Defence Research and Development Organisation (DRDO) is setting up the facility to ease the burden on existing hospitals in the union territory.

District Development Council (DDC) member Manzoor Ahmad told ANI that Lieutenant Governor Manoj Sinha will inaugurate the facility in two to four days.

"We have put in a lot of efforts to set this up. This hospital can be accessed by people from the Pulwama district also due to its central location. It will surely reduce the load on hospitals. 500 beds is a huge capacity," said Ahmad.

Ghulam Hassan, a local resident, lauded the efforts of the administration and DRDO.

Speaking to ANI, he said, "It is a massive set up and we appreciate it. People from nearby districts and isolated places can also come here for treatment."

Another resident of the area Reyaz Ahmad appreciated the initiative of the administration amid the Covid-19 pandemic.

"This is a very welcome step. It is greatly beneficial due to its immense capacity. The business will also soar here," he said.

Earlier in May, the Financial Commissioner of Jammu and Kashmir's Health and Medical Education Department Atal Dulloo had announced the setting up of two Covid-19 hospitals. One in Bhagwati Nagar, Jammu and the other in Srinagar.

According to the Union Health Ministry, Jammu and Kashmir currently has 31,579 active cases of Covid-19. (ANI)

<https://www.aninews.in/news/national/general-news/j-k-srinagars-500-bed-covid-19-hospital-in-final-stages-of-completion20210603132658/>



J-K: Srinagar's 500 bed Covid-19 hospital in final stages of completion

कम गंभीर मरीजों को डीआरडीओ के काेविड अस्पताल में भर्ती करने पर चल रहा मंथन

By Skand Shukla

कोरोना के कम गंभीर मरीजों को मेडिकल कॉलेज कैंपस के नवनिर्मित फेब्रिकेटेड कोविड अस्पताल में भर्ती करने पर विचार चल रहा है। इससे डा. सुशीला तिवारी अस्पताल से कोरोना मरीजों का दबाव कम होगा।

हल्द्वानी: कोरोना के कम गंभीर मरीजों को मेडिकल कॉलेज कैंपस के नवनिर्मित फेब्रिकेटेड कोविड अस्पताल में भर्ती करने पर विचार चल रहा है। इससे डा. सुशीला तिवारी अस्पताल से कोरोना मरीजों का दबाव कम होगा। जिससे भविष्य में गैर कोविड मरीजों को एसटीएच आने में किसी तरह की हिचक नहीं होगी। हल्द्वानी मेडिकल कॉलेज कैंपस में 500 बेड का अस्पताल तैयार हो चुका है। डाक्टर व कुछ नर्सिंग स्टाफ की नियुक्ति हो चुकी है। एसटीएच के चिकित्सा अधीक्षक डा. अरुण जोशी ने बताया कि नए अस्पताल को शुरू करने को लेकर मंथन चल रहा है। कोरोना के कम गंभीर मरीजों को नए अस्पताल में भर्ती करने के साथ शुरुआत हो सकती है। ब्लैक फंगस व कोरोना के गंभीर मरीजों को एसटीएच में रखने पर विचार चल रहा है। जल्द ही अंतिम फैसला लिया जाएगा।



ब्लैक फंगस का एक और मरीज मिला

सुशीला तिवारी अस्पताल में कोरोना के 127 मरीज भर्ती हैं। इसमें 30 गंभीर व 18 अति गंभीर हैं। गुरुवार को चार मरीजों को डिस्चार्ज किया गया, जबकि छह की मौत हो गई। गुरुवार को ब्लैक फंगस का एक मरीज मिलने से मरीजों की संख्या बढ़कर 17 पहुंच गई है। एमएस डा. अरुण जोशी ने बताया कि 302 ऑक्सीजन व 12 आइसीयू बेड खाली हैं। जिले में गुरुवार को कोविड के 75 नए केस आए। 614 की रिपोर्ट का इंतजार है।

एक और प्राइवेट लैब को कोरोना जांच की अनुमति

हल्द्वानी। मुखानी चौराह स्थित जीवन ज्योति डायग्नोस्टिक सेंटर को कोरोना की जांच की अनुमति मिल गई है। लैब संचालक डा. पूनम महेश ने बताया कि सेंटर पर आकर सैंपल देने पर 700 रुपये व घर जाकर सैंपल लेने के 900 रुपये शुल्क अदा करना होगा। घर पर सैंपल देने के लिए मोबाइल नंबर 8859065685 पर संपर्क किया जा सकता है। डा. पूनम ने बताया कि 24 घंटे में रिपोर्ट उपलब्ध कराई जाएगी। जिले में कोरोना की जांच करने वाले प्राइवेट लैब की संख्या बढ़कर तीन हो गई है।

<https://www.jagran.com/uttarakhand/nainital-less-serious-patients-will-be-admitted-to-drdo-covid-hospital-hldwani-21706232.html>



Fri, 04 June 2021

Indian Ambassador welcomed to Ireland on oxygen analyzer trip

By Anthony Wright

The Process Sensing Technologies (PST) oxygen division welcomed Indian Ambassador to Ireland, Sandeep Kumar, and a team of technical specialists from the Defence Research and Development Organisation (DRDO) to their manufacturing facility in Nava, County Meath.

As part of the Indian government's response to the Covid-19 pandemic, the PST oxygen division provided the SenTx and a range of OEM Oxygen Analyzer solutions for integration into locally manufactured oxygen generators.

During the visit, Kumar was privy to PST's manufacturing process and their range of oxygen analyzers and oxygen generators. He also gave thanks to the PST staff for their efforts in supporting the deployment of this technology to battle the Covid-19 pandemic in India.

The push for more medical-grade oxygen in Indian came after the Indian Prime Minister, Narendra Modi, called for an increase in production in mid-April.

With daily case numbers reaching above 400,000, the DRDO have played an important role in tackling the advance of Covid-19 in India.

David Beirne, PST oxygen's Business Development Director, hosted the event and also gave his thanks to staff for their efforts.

<https://www.gasworld.com/indian-ambassador-welcomed-to-ireland-on-oxygen-analyser-trip/2021000.article>

Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Thu, 03 June 2021 4:13PM

Chief of Army Staff reviews security along the line of control in Kashmir

On the second day of his two-day visit to the Kashmir Valley, General MM Naravane, Chief of Army Staff (COAS) reviewed the security situation along the Line of Control.

The COAS accompanied by Lt Gen YK Joshi, the Northern Army Commander and Lt Gen DP Pandey, Chinar Corps Commander visited the formations and units, wherein the local Commanders briefed the COAS on the existing security situation and the measures instituted to foil infiltration by terrorists from Pakistan Occupied Jammu and Kashmir. The COAS interacted with the troops and complimented them for their high morale and the high state of operational preparedness. While appreciating the current state of peace prevailing along the Line of Control, he cautioned all commanders and troops to not let their guard down and to remain prepared to meet any emerging security challenges effectively. The Army Chief also complimented all Government agencies for their close coordination in maintaining peace in the region and reaching out to the people wholeheartedly to combat the spread of the COVID-19 pandemic.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1724061>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 03 June 2021 4:13PM

सेना प्रमुख ने कश्मीर में नियंत्रण रेखा पर सुरक्षा स्थिति का जायजा लिया

कश्मीर घाटी की अपनी दो दिवसीय यात्रा के दूसरे दिन, सेना प्रमुख (सीओएएस) जनरल एम. एम. नरवणे ने नियंत्रण रेखा पर सुरक्षा हालात का जायजा लिया।

सेना प्रमुख ने सेना की उत्तरी कमान के कमांडर लेफ्टिनेंट जनरल वाई. के. जोशी और चिनार कोर के कमांडर लेफ्टिनेंट जनरल डी. पी. पांडेय के साथ आंतरिक इलाकों की इकाइयों का दौरा किया, जहां पर स्थानीय कमांडरों ने सुरक्षा की वर्तमान स्थिति के बारे में सेना प्रमुख को अवगत कराया तथा आतंकवादियों द्वारा की जाने वाली घुसपैठ की कोशिशों को विफल करने के लिए किए गए उपायों की भी जानकारी दी। थल



सेनाध्यक्ष ने जवानों के साथ भी बातचीत की और अभियान संबंधी उनकी उच्च स्तर की तैयारियों तथा ऊंचा मनोबल बनाकर रखने के लिए उनकी प्रशंसा की। नियंत्रण रेखा पर शांति की वर्तमान स्थिति की सराहना करते हुए, उन्होंने सभी कमांडरों एवं टुकड़ियों को आगाह किया कि, वे सैनिकों मनोबल बनाए रखें और किसी भी उभरती सुरक्षा चुनौती का प्रभावी ढंग से सामना करने के लिए तैयार रहें। सेना प्रमुख ने सभी सरकारी एजेंसियों को क्षेत्र में शांति बनाए रखने और कोविड-19 महामारी के प्रसार का मुकाबला करने के लिए लोगों तक पहुंचने में उनके निकट समन्वय के लिए तहेदिल से बधाई दी।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1724136>



Press Information Bureau
Government of India

Ministry of Defence

Thu, 03 June 2021 3:50PM

CINCAN visits units of ANC in Nicobar Group of Islands

Commander-in-Chief Andaman & Nicobar Command (CINCAN) Lt Gen Ajai Singh visited the military units and formations in the Nicobar Group of Islands on June 03, 2021. He visited Naval Air Station Baaz, Campbell Bay and Air Force Station Car Nicobar, where he was briefed about the operational readiness and preparedness.

During his visit to INS Baaz, the southernmost military airfield of India and the outpost at Indira Point, the southernmost point of India, Lt Gen Ajai Singh encouraged the personnel to maintain high vigil and appreciated their dedication. At Car Nicobar, he honoured the personnel and families who had lost their lives during the Tsunami on December 26, 2004 by laying a wreath in their memory at the Tsunami Memorial there.



The CINCAN interacted with the troops of the Indian Army, Indian Navy, Indian Air Force, Indian Coast Guard, Defence Security Corps, General Reserve Engineer Force as well as defence civilians stationed at Campbell Bay and Car Nicobar. He complimented all ranks for their performance and exhorted them to continue the good work and maintain a high state of alertness and operational readiness. Lt Gen Singh advised the personnel to continue strict protective measures against the COVID-19 pandemic.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1724157>



Thu, 03 June 2021 3:50PM

अंडमान-निकोबार कमान के कमांडर-इन-चीफ ने निकोबार द्वीप समूह में एएनसी की इकाइयों का दौरा किया

कमांडर-इन-चीफ अंडमान एंड निकोबार कमांड (सीआईएनसीएएन) लेफ्टिनेंट जनरल अजय सिंह ने 03 जून, 2021 को निकोबार द्वीप समूह में सैन्य इकाइयों और संरचनाओं का दौरा किया। उन्होंने नौसेना के एयर स्टेशन बाज, कैंपबेल बे और कार निकोबार एयरफोर्स स्टेशन का दौरा किया जहां उन्हें सैन्य अभियान संबंधी तत्परता एवं तैयारियों के बारे में जानकारी दी गई।

आईएनएस बाज, भारत के सबसे दक्षिणी सैन्य हवाई क्षेत्र एवं देश के सबसे दक्षिणी बिंदु में स्थित चौकी इंदिरा पॉइंट की यात्रा के दौरान लेफ्टिनेंट जनरल अजय सिंह ने कर्मियों को निगरानी का उच्च स्तर बनाए रखने के लिए प्रोत्साहित किया और उनके समर्पण की सराहना की। कार निकोबार में उन्होंने 26 दिसंबर, 2004 को सुनामी के दौरान जान गंवाने वाले कर्मियों और परिवारों को वहां स्थित सुनामी स्मारक में उनकी स्मृति में पुष्पांजलि अर्पित करके सम्मानित किया।



अंडमान एंड निकोबार कमांड के कमांडर-इन-चीफ ने भारतीय सेना, भारतीय नौसेना, भारतीय वायु सेना, भारतीय तटरक्षक, डिफेंस सिक्योरिटी कोर, जनरल रिजर्व इंजीनियर फोर्स के साथ-साथ कैंपबेल बे और कार निकोबार में तैनात रक्षा नागरिकों के साथ बातचीत की। उन्होंने सभी रैंकों के प्रदर्शन की सराहना की और आह्वान किया कि वे अच्छा काम जारी रखें एवं सतर्कता व परिचालन तत्परता की उच्च स्थिति बनाए रखें। लेफ्टिनेंट जनरल सिंह ने कर्मियों को कोविड-19 महामारी के खिलाफ सख्त सुरक्षात्मक उपाय जारी रखने की सलाह दी।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1724223>



Press Information Bureau
Government of India

Ministry of Defence

Thu, 03 June 2021 12:44PM

INS Sandhayak to be Decommissioned on 04 Jun 21

INS Sandhayak, the first of its class indigenously designed and built Hydrographic Survey Ship of Indian Navy, will be decommissioned on Friday, 04 Jun 21 after serving the nation for 40 years. The decommissioning ceremony of INS Sandhayak will be held at Naval Dockyard Visakhapatnam and will be a low-key event attended only by in-station officers and sailors with strict observance of COVID protocols.

Sandhayak was conceptualised by then Chief Hydrographer to the Govt. of India, Rear Adm FL Fraser, AVSM, Padma Shri who had a strong desire for indigenously designed and built hydrographic survey vessels in India. The design was finalised by Naval Headquarters and the construction of the ship began at GRSE Kolkata (then Calcutta) by laying the keel in



1978. The ship was commissioned to the Indian Navy on 26 Feb 1981 by Vice Adm MK Roy, AVSM then Flag Officer Commanding-in-Chief Eastern Naval Command(ENC). Since commissioning, she has been the *Alma-Mater* nurturing the hydrographers of the Indian Navy thereby laying the foundation of complete hydrographic coverage of the peninsular waters. Also, the success of her design paved way for all the Survey ships of the Indian Navy in various modifications till recently.

The ship, during her commissioned service, has undertaken approximately 200 major Hydrographic Surveys and numerous minor surveys in both East and West coasts of the country, the Andaman seas and the neighbouring countries too. Apart from Survey Missions, the ship has been an active participant in many significant operations such as *Op Pawan* – assisting the Indian Peace Keeping Force in Sri Lanka in 1987, *Op Sarong*, *Op Rainbow* - rendering humanitarian assistance post Tsunami of 2004 and participation in maiden joint INDO-US HADR Exercise '*Tiger-Triumph*'.

In its glorious 40 years, the ship saw 22 Commanding Officers at the helm, with the last Commanding Officer taking charge of the ship on 17 Jun 19. With the sunset on Friday, the Naval Ensign and the Commissioning Pennant will be hauled down for the last time onboard INS Sandhayak, in the presence of Vice Adm Ajendra Bahadur Singh, AVSM, VSM Flag Officer Commanding-in-Chief ENC symbolising the decommissioning.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1723980>



Press Information Bureau
Government of India

Ministry of Defence

Thu, 03 June 2021 3:50PM

MoD signs contract to procure 11 Airport Surveillance Radars for Indian Navy & Indian Coast Guard

Ministry of Defence signed a contract with M/s Mahindra Telephonics Integrated Systems Ltd., Mumbai for procurement of 11 Airport Surveillance Radars with Monopulse Secondary Surveillance Radar for Indian Navy and Indian Coast Guard on June 03, 2021. The procurement, at a cost of Rs 323.47 crore, will be made under the 'Buy & Make' category. The installation of these radars will increase the air domain awareness around airfields and enhance safety & efficiency in flying operations of Indian Navy and Indian Coast Guard.

The signing of this contract is an achievement of the Government towards 'AtmaNirbhar Bharat Abhiyan' and the objectives envisaged in the programme. This would enable absorption of technology, skill development and indigenous manufacture, boosting employment opportunities.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1724052>

Onus on continuation of ceasefire, removal of mistrust lies with Pakistan: Indian Army Chief

Asked whether Army has lowered guard along the LoC, he said while a ceasefire is on, militant infrastructure, militant camps and militants continue to be on the other side of LoC

By Fayaz Wani

Srinagar: Army Chief General MM Naravane on Thursday said responsibility and onus on continuity of border ceasefire and removal of mistrust with India lie solely with Pakistan.

“The border ceasefire is holding. The onus to ensure that ceasefire lies with Pakistan. We are willing to observe the ceasefire as long as they do so,” General Naravane told media persons during his second-day visit to the Valley.

Asked whether Army has lowered guard along the LoC, he said while a ceasefire is on, militant infrastructure, militant camps and militants continue to be on the other side of LoC. “Therefore there can be no slackening in our preparedness and alertness.”

Asked whether the ceasefire has reduced mistrust between India and Pakistan, Army chief said, “Trust is a very difficult thing to come by. It

takes a very long time to develop. There have been decades of mistrust in India and Pakistan and obviously, the situation on that score cannot change overnight”.

“However, if the ceasefire continues and they (Pakistan) continues to observe ceasefire in letter and spirit and stop and desist from pushing militants across and foment trouble in India, then all small steps will definitely go incrementally in building trust between two countries. The onus is entirely on Pakistan to build upon whatever has been achieved so far”.

On the thinning of troops, he said, “We cannot reduce alertness and preparedness. We have a counter-infiltration grid to prevent any movement from across LoC. We also have a counter militancy grid in the hinterland. All these deployments are dynamic and they depend on situation and threat perception”.

“However, we keep reviewing deployments and if situation permits, then we pull out some troops from active deployment to the rare areas so that they get time for rest and relief”.

General Naravane said Army’s role in J&K is to bring the level of violence to an extent, where civil administration and local security forces can then play their role in the development of the region.

“Army’s role is to work with local administration and other forces. Our ultimate aim is to bring level of violence so that peace and development can take place in J&K,” he said.

Asked how he sees the security situation in J&K, Army chief said, “All security parameters have seen great improvement. There have been very few militants initiated incidents, hardly any cases of stone pelting and no IED attacks in the recent past. All these are indicators or return of sense of normalcy”.

In response to a question on Amarnath yatra, he said, “We are prepared and taken all necessary steps for smooth conduct of Amarnath yatra. The decision to conduct the yatra lies with the civil administration. But we are ready from our side.”

The 56-day Amarnath yatra is scheduled to start from 28 June. However, due to the outbreak of the second Covid-19 wave, it is not known whether J&K government would allow the yatra or not.



Army Chief General MM Naravane (Photo | PTI)

Asking youth to shun the path of violence, General Naravane said, “Violence does not get you anywhere. The youth should embrace the future and world over the future lies in shunning violence. And if you do that, it will only hasten the process of ushering in a new era of development and prosperity in J&K.”

Earlier, the Army chief visited the formations and units along the LoC and was briefed by the local commanders about the existing security situation and measures taken to foil infiltration by militants from across the LoC.

While interacting with troops, he cautioned all commanders and troops to not let their guard down and remain prepared to meet any emerging security challenges effectively.

<https://www.newindianexpress.com/nation/2021/jun/03/onus-on-continuation-of-border-ceasefire-removal-of-mistrust-lies-with-pakistan-indian-army-chief-2311353.html>



Fri, 04 June 2021

12 OEMs receive fresh RFI for 1,700 FRCV

According to the RFI, the Indian Army has plans to get 1,700 FRCVs, Transfer of Technology (ToT), maintenance and training requirements, as well as performance based logistics and engineering support packages

By Huma Siddiqui

A fresh Request for Information (RFI) to procure over 1,700 Future Ready Combat Vehicles (FRCVs) by the Indian Army has reached twelve manufacturers (Original Equipment Manufacturers). The RFI for the future tanks is going to be through the Strategic Partnership (SP) route and the induction of which is expected to be completed by 2030.

According to a senior officer, “The FRCV platform which the Indian Army is looking for is expected to be for future warfare and is also expected to have the capability to be used on other specialised fighting vehicles.”

Which countries/companies received the RFI and what will be offered?

The OEMs include: France Leclerc Nexter; Russia 1) T-90 & T-14 Armata Uralvagonzavod marketed by Rosoboronexpo (ROE); South Korea K1 Hyundai Rotem; USA M1AX (Abrams) General Dynamics; Germany Leopard KMW and Rheinmetall; Ukraine T – 84 Malyshev Plant marketed by Spectstechno Expo; Italy Ariete Consortium Iveco and Oto Melara (Leonardo); Serbia M – 84 Yugoimport; Israel Merkava Mantak/ Israel Ordnance Corps; UK’s Challenger; and Turkey’s Altay Otokar. And, Indian Defence Research and Development Organisation.



FRCV, is an armoured platform and when inducted in the Indian Army, will be used primarily for the Main Battle Tank (MBT).

The RFI specifies the requirements

According to the RFI, the Indian Army has plans to get 1,700 FRCVs, Transfer of Technology (ToT), maintenance and training requirements, as well as performance based logistics and engineering support packages.

The companies are expected to respond by mid-September.

What happens to the previous RFI?

In 2017, a RFI was floated for the procurement of FRCV and now it stands cancelled.

Financial Express Online had reported earlier that South Korea based Hyundai Rotem was one of the companies which had expressed interest in producing the USD 5 billion FRCV meant for the

Mechanized Forces. The requirement as per the previous RFI was for 2000 units to be produced under the 'Make in India' initiative.

The previous RFI had also specified ToT by the OEM, 40 percent indigenous content, upgrade plans, create ecosystems, and life cycle costs.

The 2017 RFI was issued under the 'Make' category and as per Chapter – VII under the Defence Procurement Procedure—2016 — provisions of the Armoured Fighting Vehicle segment of 'Strategic Partnership' model route.

Difference between FRCV and Future Infantry Combat Vehicle (FICV)

FRCV, is an armoured platform and when inducted in the Indian Army, will be used primarily for the Main Battle Tank (MBT).

The procurement of the FRCV is expected to replace the Indian Army's old fleet of 2,414 Soviet-origin T-72 tanks. The FRCV is expected to be medium weight (45-50 ton). It is expected to operate in different terrains – like high altitude areas, developed, and desert terrain.

The Indian Army was looking for FICV for the replacement of obsolete BMP II (procured in mid-1980's) which began its journey through an AON (Acceptance of Necessity) in Oct 2009, under DPP 2008, Make Chapter. This was for 2610 combat vehicles. However, as reported by the Financial Express Online, earlier, this FICV has been launched two times through Expression of Interest in 2010 and later in 2015. After undergoing several rounds of tedious evaluations by IPMT, the project has been put on hold.

What is the Indian Army keen on?

The Russian T-14 Armata, Ukrainian Oplot, French LeClerc and South Korean K2 Black Panther main battle tanks, preferred last time.

According to sources, the American M1 Abrams and the German Leopard due their heavy weight may not fit the specifications mentioned in the RFI.

In the previous RFI Indian companies including Tata Motors, Reliance Defence and Engineering Limited, Mahindra Group, Bharat Forge, Punj Lloyd, Tata Power SED, Titagarh Wagons, and Tractors India had expressed interest in forming a joint venture with the OEMs.

As reported earlier, the FRCVs are expected to have different variants: air-defense gun/missile system; artillery observation post vehicle; engineer reconnaissance vehicle; tracked main battle tank; tracked light tank; wheeled version; bridge layer tank; trawl tank; mine ploughs; armoured recovery vehicle; self-propelled artillery gun/howitzer; and armoured ambulance role.

<https://www.financialexpress.com/defence/12-oems-receive-fresh-rfi-for-1700-frcv/2264711/>

China providing Venezuela with powerful military hardware: Reports

Although the Venezuelan Navy has not been a top concern for the US Department of Defense, reports have emerged that China is supplying Venezuela with some rather powerful weapons that could shift the balance of power in the region.

Caracas: Although the Venezuelan Navy has not been a top concern for the US Department of Defense, reports have emerged that China is supplying Venezuela with some rather powerful weapons that could shift the balance of power in the region. In September 2020, the Venezuelan government under President Nicolas Maduro released some propaganda videos that suggest that its warships have been armed with new Chinese-made anti-ship missiles that can target enemy vessels from over 100 nautical miles away, writes Peter Suci for The National Interest.



Representative Image. Image Credit: ANI

Maduro said that his country is planning to manufacture its own weapons and announced the establishment of a special military and scientific system for that purpose. This comes as his regime has been prevented by international sanctions from buying Western-made arms.

Therefore, Venezuela has turned to the usual suspects of China, Russia and Iran in a bid to modernise its armed forces, as Beijing has been among the largest purchasers of the country's crude oil.

In recent times, Venezuela has undertaken efforts to establish its own domestic arms industry. The propaganda videos, shared on Maduro's official Twitter account, did not actually feature any Venezuelan warships, rather the footage was from the Thai Navy frigate HTMS Karaburi. The best guess is that Beijing may have supplied the missiles to Caracas, but the platform wasn't likely installed in time for the commemoration event in September 2020, during which the acquisition was announced.

It has also been speculated that the Chinese missiles could eventually be installed on the Venezuelan Navy's Guaiqueri-class patrol boats, which were built in Spain but delivered without anti-ship missiles, according to The National Interest. The reports have led to questions on how Caracas will actually pay for the missiles purchased from China, given the country's ongoing economic problems.

However, Suci writes that as long as Beijing needs oil, something which Venezuela has in abundance, it is likely military hardware such as the C-802A missiles will continue to flow to the South American country, posing a potential threat to the United States. (ANI)

(This story has not been edited by Devdiscourse staff and is auto-generated from a syndicated feed.)

<https://www.devdiscourse.com/article/international/1598344-china-providing-venezuela-with-powerful-military-hardware-reports>



Press Information Bureau
Government of India

Ministry of Science & Technology

Thu, 03 June 2021 5:41PM

Nanorod based oxygen sensor working at room temperature can save lives in places like underground mines, higher altitudes

Indian Scientists have developed a nanorods-based oxygen sensor which works at room temperature with assistance of UV irradiation and can detect oxygen gas concentrations in places such as underground mines, at higher altitudes, inside aeroplanes and research labs.

Monitoring O₂ concentration in very low ppm-level is of paramount importance, and a fast and selective oxygen sensor working at room temperature can save lives in places like underground mines, higher altitudes and improve the accuracy of numerous experiments being conducted in research labs.

A team of scientists led by Dr S. Angappane, a Scientist at the Centre for Nano and Soft Matter Sciences (CeNS), an autonomous research institute under the Department of Science & Technology, Government of India, have fabricated a metal oxide semiconductor (MOS) nanorods array-based oxygen sensor which works at room temperature with assistance of UV irradiation and can detect broad ppm range of oxygen gas concentrations. They used titanium oxide for the purpose and work, involving Hiran Jyothilal, Gaurav Shukla, Sunil Walia, and Bharath SP led by Dr S. Angappane, published in the journal *Materials Research Bulletin*.

The team showed that the sensor gives the best sensitivity with low power consumption and works at room temperature. The fabricated sensors exhibited response and recovery times of around 3 sec and 10 sec, respectively, at 1000 ppm. The sensor works in oxygen concentrations ranging from 25 ppm to 10 lakh ppm (100%) with good stability. The superior sensing property is attributed to the enhanced electrical conductivity, excitons (combination of an electron and a positive hole) created, and desorption of water molecules (released through surface) from the sensor surface by UV irradiation, facilitating increased interaction of oxygen molecules with chromium incorporated in titanium dioxide slanted nanorods array present in the sensor.

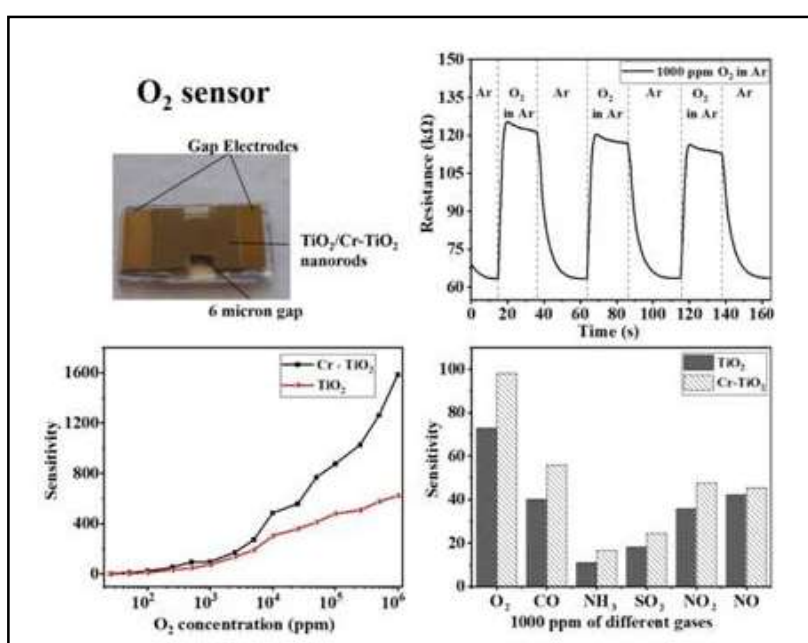


Fig: (Top left) An oxygen sensor device used for sensing experiments, (Top right) A room temperature sensing response plot of Cr-TiO₂ based oxygen sensor device towards 1000ppm O₂, which showed the best sensitivity, (Bottom left) Sensitivity comparison plot of TiO₂/Cr-TiO₂ based oxygen sensor devices towards different ppm range of O₂, (Bottom right) Selectivity plot showing high sensitivity of TiO₂/Cr-TiO₂ based sensor devices towards O₂.

The CeNS team is further working on miniaturising the sensor and its electronics interfacing with other gas sensors to fabricate a suitable electronic nose.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1724113>



पत्र सूचना कार्यालय
भारत सरकार

विज्ञान एवं प्रौद्योगिकी मंत्रालय

Thu, 03 June 2021 5:41PM

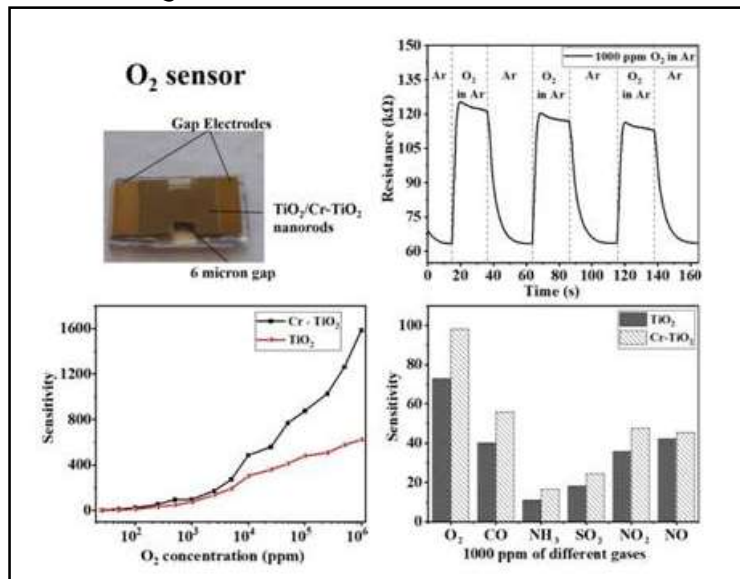
कमरे के तापमान पर काम करने वाले नैनोरोड आधारित ऑक्सीजन सेंसर भूमिगत खदानों, अधिक ऊंचाई वाले स्थानों में लोगों की जान बचा सकते हैं

भारतीय वैज्ञानिकों ने एक नैनोरोड्स-आधारित ऑक्सीजन सेंसर विकसित किया है जो अल्ट्रा वायलेट (यूवी) विकिरण की सहायता से सामान्य (कमरे के) तापमान पर काम करता है और भूमिगत खदानों/ खानों, अत्यधिक ऊंचे ऊंचाई वाले स्थानों, हवाई जहाज और अनुसंधान प्रयोगशालाओं जैसे स्थानों में ऑक्सीजन गैस की सांद्रता का पता लगा सकता है।

बहुत कम पीपीएम-स्तर में ऑक्सीजन (O₂) सांद्रता की निगरानी सबसे महत्वपूर्ण है, और कमरे के तापमान पर काम करने वाला एक तेज़ और चयनात्मक ऑक्सीजन सेंसर भूमिगत खदानों, उच्च ऊंचाई जैसी जगहों पर लोगों की जान बचा सकता है और अनुसंधान प्रयोगशालाओं में किए जा रहे कई प्रयोगों की सटीकता में सुधार कर सकता है।

विज्ञान और प्रौद्योगिकी विभाग, भारत सरकार के तहत एक स्वायत्त अनुसंधान संस्थान, सेंटर फॉर नैनो एंड सॉफ्ट मैटर साइंसेज (सीईएनएस) के वैज्ञानिक डॉ. एस. अंगप्पन के नेतृत्व में वैज्ञानिकों की एक टीम ने मेटल ऑक्साइड सेमीकंडक्टर (एमओएस) का निर्माण किया है। नैनोरोड्स एरे (सरणी)-आधारित ऑक्सीजन यह सेंसर यूवी विकिरण की सहायता से कमरे के तापमान पर काम करता है और

ऑक्सीजन गैस की सांद्रता की व्यापक पीपीएम रेंज का पता लगा सकता है। डॉ. एस.अंगप्पन के नेतृत्व में हिरन ज्योतिलाल, गौरव शुक्ला, सुनील वालिया और भरत एसपी का सहयोग लेते हुए हुए इस उद्देश्य



चित्र : (ऊपर बाएं) सेंसिंग प्रयोगों के लिए इस्तेमाल किया जाने वाला एक ऑक्सीजन सेंसर डिवाइस, (ऊपर दाएं) 1000पीपीएम O₂ के प्रति क्रोमियम-टाइटेनियम डाई ऑक्साइड (Cr-TiO₂) आधारित ऑक्सीजन सेंसर डिवाइस का एक कमरे का तापमान सेंसिंग रिस्पॉन्स प्लॉट, जिसने सबसे अच्छी संवेदनशीलता दिखाई, (नीचे बाएं) संवेदनशीलता तुलना प्लॉट O₂ की विभिन्न पीपीएम रेंज की ओर टाइटेनियम डाईऑक्साइड/ क्रोमियम-टाइटेनियम डाई ऑक्साइड (TiO₂/Cr-TiO₂) आधारित ऑक्सीजन सेंसर डिवाइस, (नीचे दाएं) चयनात्मकता प्लॉट O₂ के प्रति टाइटेनियम डाईऑक्साइड/ क्रोमियम-टाइटेनियम डाई ऑक्साइड (TiO₂/Cr-TiO₂) आधारित सेंसर उपकरणों की उच्च संवेदनशीलता को दर्शाता है।

और कार्य के लिए टाइटेनियम ऑक्साइड का उपयोग किया और इसके विवरण को और सामग्री अनुसंधान पत्रिका *बुलेटिन* में प्रकाशित किया।

टीम ने प्रदर्शित किया कि यह सेंसर कम बिजली की खपत के साथ सबसे अच्छी संवेदनशीलता देता है और कमरे के तापमान पर काम करता है। तैयार किए गए सेंसरों ने 1000 पीपीएम पर क्रमशः लगभग 3 सेकंड और 10 सेकंड की प्रतिक्रिया और पुनर्प्राप्ति का समय प्रदर्शित किया। सेंसर अच्छी स्थिरता के साथ 25 पीपीएम से 10 लाख पीपीएम (100%) तक ऑक्सीजन सांद्रता में काम करता है। सुपीरियर सेंसिंग प्रॉपर्टी का कारण बढ़ी हुई विद्युत चालकता, एक्साइटन (एक इलेक्ट्रॉन और एक धनात्मक छिद्र का संयोजन) और यूवी विकिरण द्वारा सेंसर सतह से पानी के अणुओं (सतह से बाहर निकलने वाले) के अवशोषण बताया जाता है, जिससे ऑक्सीजन अणुओं की बढ़ी हुई मात्रा के स्लैटेड नैनोरोड्स एरे (तिरछी नैनोरोड्स सरणी) में मौजूद टाइटेनियम डाइऑक्साइड में निहित क्रोमियम से परस्पर सम्पर्क में आसानी होती है।

सीईएनएस टीम एक उपयुक्त इलेक्ट्रॉनिक नाक (नोज) बनाने के लिए सेंसर और उसकी इलेक्ट्रॉनिक्स इंटरफेसिंग को अन्य गैस सेंसर के साथ मिलाकर और छोटे स्वरूप में विकसित करने पर काम कर रही है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1724209>



Fri, 04 June 2021

Scientists discover new approach to stabilize cathode materials

By Stephanie Kossman

A team of researchers led by chemists at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory has studied an elusive property in cathode materials, called a valence gradient, to understand its effect on battery performance. The findings, published in *Nature Communications*, demonstrated that the valence gradient can serve as a new approach for stabilizing the structure of high-nickel-content cathodes against degradation and safety issues.

High-nickel-content cathodes have captured the attention of scientists for their high capacity, a chemical property that could power electric vehicles over much longer distances than current batteries support. Unfortunately, the high nickel content also causes these cathode materials to degrade more quickly, creating cracks and stability issues as the battery cycles.

In search of solutions to these structural problems, scientists have synthesized materials made with a nickel concentration gradient, in which the concentration of nickel gradually changes from the surface of the material to its center, or the bulk. These materials have exhibited greatly enhanced stability, but scientists have not been able to determine if the concentration gradient alone was responsible for the improvements. The concentration gradient has traditionally been inseparable from another effect called the valence gradient, or a gradual change in nickel's oxidation state from the surface of the material to the bulk.

In the new study led by Brookhaven Lab, chemists at DOE's Argonne National Laboratory synthesized a unique material that isolated the valence gradient from the concentration gradient.



Brookhaven chemist Ruoqian Lin, first author of the study. Credit: Brookhaven National Laboratory

"We used a very unique material that included a nickel valence gradient without a nickel concentration gradient," said Brookhaven chemist Ruoqian Lin, first author of the study. "The concentration of all three transition metals in the cathode material was the same from the surface to the bulk, but the oxidation state of nickel changed. We obtained these properties by controlling the material's atmosphere and calcination time during synthesis. With sufficient calcination time, the stronger bond strength between manganese and oxygen promotes the movement of oxygen into the material's core while maintaining a Ni²⁺ oxidation state for nickel at the surface, forming the valence gradient."

Once the chemists successfully synthesized a material with an isolated valence gradient, the Brookhaven researchers then studied its performance using two DOE Office of Science user facilities at Brookhaven Lab—the National Synchrotron Light Source II (NSLS-II) and the Center for Functional Nanomaterials (CFN).

At NSLS-II, an ultrabright X-ray light source, the team leveraged two cutting-edge experimental stations, the Hard X-ray Nanoprobe (HXN) beamline and the Full Field X-ray Imaging (FXI) beamline. By combining the capabilities of both beamlines, the researchers were able to visualize the atomic-scale structure and chemical makeup of their sample in 3D after the battery operated over multiple cycles.

"Both beamlines have world-leading capabilities. You can't do this research anywhere else," said Yong Chu, leader of the imaging and microscopy program at NSLS-II and lead beamline scientist at HXN. "FXI is the fastest nanoscale beamline in the world; it's about ten times faster than any other competitor. HXN is much slower, but it's much more sensitive—it's the highest resolution X-ray imaging beamline in the world."

HXN beamline scientist Xiaojing Huang added, "At HXN, we routinely run measurements in multimodality mode, which means we collect multiple signals simultaneously. In this study, we used a fluorescence signal and a phytography signal to reconstruct a 3D model of the sample at the nanoscale. The fluorescence channel provided the elemental distribution, confirming the sample's composition and uniformity. The phytography channel provided high-resolution structural information, revealing any microcracks in the sample."

Meanwhile at FXI, "the beamline showed how the valence gradient existed in this material. And because we conducted full-frame imaging at a very high data acquisition rate, we were able to study many regions and increase the statistical reliability of the study," Lin said.

At the CFN Electron Microscopy Facility, the researchers used an advanced transmission electron microscope (TEM) to visualize the sample with ultrahigh resolution. Compared to the X-ray studies, the TEM can only probe a much smaller area of the sample and is therefore less statistically reliable across the whole sample, but in turn, the data are far more detailed and visually intuitive.

By combining the data collected across all of the different facilities, the researchers were able to confirm the valence gradient played a critical role in battery performance. The valence gradient "hid" the more capacitive but less stable nickel regions in the center of the material, exposing only the more structurally sound nickel at the surface. This important arrangement suppressed the formation of cracks.

The researchers say this work highlights the positive impact concentration gradient materials can have on battery performance while offering a new, complementary approach to stabilize high-nickel-content cathode materials through the valence gradient.

"These findings give us very important guidance for future novel material synthesis and design of cathode materials, which we will apply in our studies going forward," Lin said.

More information: Ruoqian Lin et al, Hierarchical nickel valence gradient stabilizes high-nickel content layered cathode materials, *Nature Communications* (2021). DOI: [10.1038/s41467-021-22635-w](https://doi.org/10.1038/s41467-021-22635-w)

Journal information: [Nature Communications](https://www.nature.com/articles/s41467-021-22635-w)
<https://phys.org/news/2021-06-scientists-approach-stabilize-cathode-materials.html>

Quantum computing with holes

Quantum computers, with their promises of creating new materials and solving intractable mathematical problems, are a dream of many physicists. Now, they are slowly approaching viable realization in many laboratories all over the world. But there are still enormous challenges to master. A central one is the construction of stable quantum bits—the fundamental unit of quantum computation, called "qubit" for short—that can be networked together.

In a study published in *Nature Materials* and led by Daniel Jirovec from the Katsaros group at IST Austria in close collaboration with researchers from the L-NESS Inter-university Center in Como, Italy, scientists now have created a new and promising candidate system for reliable qubits.

Spinning Absence

The researchers created the qubit using the spin of so-called holes. Each hole is simply the absence of an electron in a solid material. Amazingly, a missing, negatively charged particle can physically be treated as if it were a positively charged particle. It can even move around in the solid when a neighboring electron fills the hole. Thus, effectively, the hole described as positively charged particle is moving forward.

These holes even carry the quantum-mechanical property of spin and can interact if they come close to each other. "Our colleagues at L-NESS layered several different mixtures of silicon and germanium just a few nanometers thick on top of each other. That allows us to confine the holes to the germanium-rich layer in the middle," Jirovec explains. "On top, we added tiny electrical wires—so-called gates—to control the movement of holes by applying voltage to them. The electrically positively charged holes react to the voltage and can be extremely precisely moved around within their layer."

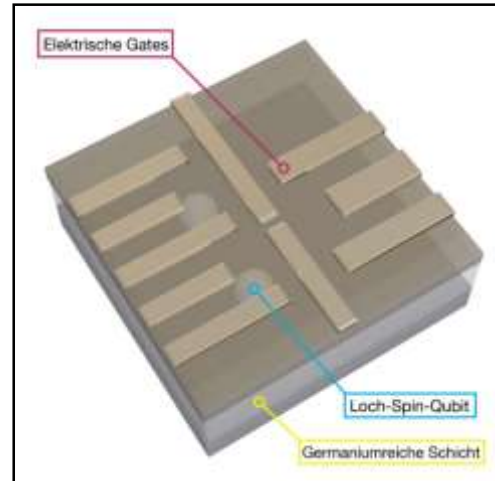
Using this nano-scale control, the scientists moved two holes close to each other to create a qubit out of their interacting spins. But to make this work, they needed to apply a magnetic field to the whole setup. Here, their innovative approach comes into play.

Linking Qubits

In their setup, Jirovec and his colleagues cannot only move holes around but also alter their properties. By engineering different hole properties, they created the qubit out of the two interacting hole spins using less than ten millitesla of magnetic field strength. This is a weak magnetic field compared to other similar qubit setups, which employ at least ten times stronger fields.

But why is that relevant? "By using our layered germanium setup we can reduce the required magnetic field strength and therefore allow the combination of our qubit with superconductors, usually inhibited by strong magnetic fields," Jirovec says. Superconductors—materials without any electrical resistance—support the linking of several qubits due to their quantum-mechanical nature. This could enable scientists to build new kinds of quantum computers combining semiconductors and superconductors.

In addition to the new technical possibilities, these hole spin qubits look promising because of their processing speed. With up to one hundred million operations per second as well as their long



The two holes are confined to the germanium-rich layer just a few nanometers thick. On top, the electrical gates are formed by individual wires with voltages applied. The positively charged holes feel the push and pull from the wires and can therefore be moved around within their layer. Credit: Daniel Jirovec

lifetime of up to 150 microseconds they seem particularly viable for quantum computing. Usually, there is a tradeoff between these properties, but this new design brings both advantages together.

More information: A singlet-triplet hole spin qubit in planar Ge, *Nature Materials* (2021). DOI: [10.1038/s41563-021-01022-2](https://doi.org/10.1038/s41563-021-01022-2), www.nature.com/articles/s41563-021-01022-2

Journal information: *Nature Materials*
<https://phys.org/news/2021-06-quantum-holes.html>

COVID-19 Research News



Fri, 04 June 2021

Long COVID: Common post COVID symptoms identified in long haulers, as per new study

Post COVID symptoms identified in long haulers

Apart from the dangers of coronavirus symptoms, post COVID complications have also posed a great deal of threat to our physical and mental well-being. While scientists and medical professionals have been investing a lot of time studying various implications of COVID-19 infections, long COVID has become a major source of concern in recent times. A team of researchers conducted yet another study to look into the same.

What is long COVID?

Long COVID is a term used to define the symptoms experienced by people long after they have recovered from the infection. While in mild and moderate cases of COVID-19, people may experience symptoms for at least 2 weeks or even less, there are patients who continue to experience long term complications 12 weeks after the period of infection, which is known as long COVID.

Study identifies common long COVID symptoms in patients

According to a new study conducted by the Stanford University School of Medicine, 70 percent of patients with moderate or severe infection experienced a variety of symptoms months after COVID recovery. The research suggested some of the most common ailments experienced by long haulers long after they had already recovered from illness. Read on to find out what these symptoms are.

Fatigue

Severe fatigue or unexplained weakness has been a common COVID-19 symptom. But according to the Stanford researchers, it is prevalent in people who have recovered from the initial illness. Given that the virus takes a heavy toll on the body's immune system and the body as a whole, patients may continue experiencing fatigue in the long run.

Brain fog

An unusual yet common post COVID symptom, brain fog makes it extremely difficult for people to focus and may lead to an inability to concentrate. It is a severe medical condition that can disrupt the proper functioning of the central nervous system. It can interrupt or cause disturbance to our cognitive abilities, which can result in mental fatigue and confusion.

Shortness of breath

Shortness of breath or dyspnea is a critical symptom of COVID that may indicate low oxygen levels in the body or extreme fatigue. It is the inability to breath smoothly and may also lead to chest pain if not treated in time.

Purpose of the study

The study, which has highlighted many key areas of post COVID, aims to look into different facets of post COVID, which may not only help them identify the causes of long-haul COVID-19, but potential treatments as well. This is why the team of researchers is looking forward to participating in a new \$1.15 billion study, initiated by the National Institutes of Health.

Dr. Steven Goodman, MD, PhD, a senior author on the study believes that there are symptoms like severe fatigue, shortness of breath, and an inability to concentrate associated with COVID-19 that don't go away. While according to him conclusions should not be drawn about the single cause of the symptoms, he believes more research needs to be conducted to look into it.

"So what we don't want is the people with the brain fog and headaches to go to the neurologist, and the people with the heart problems to go to the cardiologist, and the people with the pulmonary problems to go to the pulmonologist. They probably have a common mechanism," he said.

Reportedly, the team of researchers located 84 different symptoms in long haulers, including cognitive disorders and loss of sense of smell.

<https://timesofindia.indiatimes.com/life-style/health-fitness/health-news/long-coronavirus-symptoms-common-post-covid-symptoms-identified-in-long-haulers-as-per-new-study/photostory/83170974.cms?picid=83170997>

mint

Fri, 04 June 2021

Anti-inflammatory drugs may cause weaker immune response to Covid vaccine: Study

The study enrolled healthy people and patients treated for common immune-mediated disorders, including rheumatoid arthritis, psoriatic arthritis and psoriasis

New Delhi: Some people who take the drug methotrexate to treat common immune system disorders like rheumatoid arthritis and multiple sclerosis may mount a weaker immune response to a COVID-19 vaccine, according to a study.

People with immune-mediated inflammatory disorders are typically treated with drugs that reduce inflammation, including methotrexate.

The disorders result when the immune system, meant to fight disease and drive healing, is triggered abnormally, which in turn causes inflammation, pain and swelling.

The study, published in the journal *Annals of the Rheumatic Diseases*, looked specifically at patients' responses to the Pfizer-BioNTech mRNA COVID-19 vaccine, which the researchers measured by looking at the antibodies produced in each patient by the vaccine.

Vaccine ingredients, once injected into the body, are meant to trigger the production of antibodies, immune proteins that specifically target the viral protein, disabling it and tagging it for removal from the body.



File Photo: Vaccine ingredients are meant to trigger the production of antibodies, immune proteins that specifically target the viral protein

However, the researchers at NYU Grossman School of Medicine and NYU Langone Health in the US cautioned that the lower antibody response in patients who take methotrexate does not necessarily mean that these patients are not protected against COVID-19.

"It is most important to state that patients should not be concerned about our study findings as the majority of patients with immune system disorders are responding well to the mRNA vaccines," study co-first author Rebecca Haberman explained.

"It is also possible that methotrexate is delaying, rather than preventing, an adequate immune response against COVID-19," she added.

Researchers have known that rheumatoid arthritis patients who take methotrexate have a reduced response to seasonal flu vaccines.

Since mRNA vaccines use a new mechanism of action that patients with these common immune disorders have not seen before, the team wanted to determine how well these patients are protected.

The study enrolled healthy people and patients treated for common immune-mediated disorders, including rheumatoid arthritis, psoriatic arthritis and psoriasis.

The participants received two doses of Pfizer-BioNTech mRNA COVID-19 vaccine.

The researchers analysed blood samples to determine the amount of antibodies patients produced after receiving the vaccine.

They also measured the activation of key immune system cells, including CD8 killer T cells, which are generated as part of the body's immune response.

The study found that over 90 per cent of healthy subjects and patients taking drugs other than methotrexate to control inflammation mounted strong antibody responses.

Patients with immune-mediated inflammatory disorders who were taking methotrexate achieved an adequate response in only 62 per cent of cases.

Similarly, while healthy patients and those with common immune disorders who were taking anti-inflammatory drugs other than methotrexate produced CD8 T cells, patients taking methotrexate did not show an increase in CD8 T cell activation after vaccination.

"More research is needed to understand why such a significant proportion of people with common immune disorders who take methotrexate have deficiencies in mounting an antibody and cellular response," says study co-senior author Jose U. Scher, an associate professor at NYU Langone.

"This may not necessarily mean that the vaccine is not efficacious, but that alternate vaccine strategies need to be investigated," Scher said.

These alternate vaccine strategies include potentially discontinuing methotrexate during the time these patients receive the vaccine, changing the dosage of the drug or possibly administering a booster shot to the vaccine, he added.

<https://www.livemint.com/science/health/antiinflammatory-drugs-may-cause-weaker-immune-response-to-covid-vaccine-study-11622719392914.html>

